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Public Comments on Developing an Unified Intercarrier Compensation:=====

Title: Developing an Unified Intercarrier Compensation

FR Document Number: 2011-04399

Legacy Document ID:

RIN:

Publish Date: 3/2/2011 12:00:00 AM

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Because I am sure that you care about your survival and mine, I believe you meant to ask for ideas about how to encourage everyone in our society to eliminate radiation-emitting wireless devices and keep landlines, a technology that's proven safe.

I'm a novelist and I've also written several books about the menstrual cycle and natural family planning. I'm a teacher whose work was featured in a half-hour documentary for American Public Radio. I'm listed in who's who of American women. Since 1997, when a dentist I still dearly love installed four gold crowns over fresh mercury in my mouth, and this created oral galvanism, I've been unable to use a computer or a cell phone or be under fluorescent lights or WiFi without getting extremely sick.

Right now, I'm as employable as a pearl at the ocean's bottom.

I'm like a worker bee looking for a home.

If you eliminate landlines, I will lose my primary means for connecting with people.

Since 2004, I've made annual trips to teach in Amish communities. If you eliminate landlines, you will also eliminate their culture.

I beg you: Please do not radiate this world any more. An increasing number of studies show that wireless technologies cause cancer. The US Fish and Wildlife Service has called on Congress to investigate the relationship between bee colony collapse and telecom equipment. We can't survive without bees. Please do not install more telecom equipment until it's proven safe. Please continue to maintain landlines, a proven technology.

**CALL ME RESPONSIBLE:
Learning Federal Rules About Wireless Devices and Health
by Katie Singer
January, 2011**

*The EMR Policy Institute and Katie Singer encourage free distribution of this essay.
It will be updated as developments require.*

Suppose you learned that if certain corporations want to do business, a federal law mandates that your town cannot refuse based on the potential for these corporations to do environmental harm. You can only refuse business if you don't like how a company's equipment looks or if the equipment's appearance decreases property values.

Further, these corporations can sue your city if you take too much time to process their applications to install equipment or if they believe that you took health into account when denying them a permit.

Would you wonder why an industry would lobby for such a law?

Where would you go for proof about the safety of its equipment?

In 1996, Congress passed The Telecommunications Act, our federal statute for telecom services. Section 704 outlines the provisions stated above. Fifteen years later, most of us use cell phones and WiFi. We live, work and go to school near antennas. The Federal Communications Commission (FCC) bases its safety standards for radiation emitted by telecom equipment on engineering needs, not human biology. A national broadband plan grants telecom companies billions of dollars to install more equipment.

No government agency studies the health or environmental impacts of radiation emitted by telecom equipment. No government agency has determined the maximum daily amount of this radiation that babies, children or adults can receive before their health becomes compromised.

Mike, 42: My store's landlord has just contracted with a telecom company to install a 55-foot cell tower in my parking lot. I entered the buildings address at www.antennasearch.com and learned that there are already 250 antennas within a four-mile radius. Isn't this enough?

When I asked around about the safety of these antennas, I learned about the Telecom Act. Frankly, it shocks me. I don't know if I can give up my cell phone or wifi.

I don't know how my business will be affected by this antenna. But I'm ready to look at how telecom equipment affects human health and the environment, even if my landlord and my government are not. Call me responsible. I'm ready to learn.

When did electronics become part of our lives?

Starting in the 1890s and into the 1920s, power lines were installed around the country to provide electricity for lights. Soon, we also had electrically-powered refrigerators, ovens, washing machines, radios, televisions, typewriters and blankets. Computers became common in the 1980s.

From 2005 to 2007, the number of cell phone subscribers in the U.S. increased from 34 million (13% of the population) to 225 million (84% of the population). Worldwide, 4.5 billion people now have mobile service.

While electronics have become essential to every aspect of modern civilization, epidemiologist Samuel Milham, MD, MPH, has observed a connection between electrification and modern diseases - diabetes, heart disease and cancer.

What is electricity?

Lightning is a visible form of electricity. Two hundred years ago, two Italian scientists produced the first human-made electric current, paving the way for electricity to power machines. Electricity can also produce signals that carry information.

Usually, electricity is invisible. Behind walls, cables carry electric current that provides energy for appliances at the flick of a switch. With wireless devices like mobile phones, electromagnetic energy is not confined within cables.

What kind of information do electromagnetic signals carry?

Every organ in the human body gets information about how to function from electromagnetic signals. Your brain, heart, blood, muscles, nerves, kidneys and digestive organs communicate to each other by electromagnetic signals. So do bees, birds, cows, fish, plants and trees.

Electronic devices also require electromagnetic signals to function and to carry data. To operate a mobile phone for example, electromagnetic frequencies (EMFs) send an encoding of a person's voice from the phone to a cell phone antenna, through a network, and then to the phone that receives the call. Corded landlines convert the voice to signals that travel through cables that are designed to confine the electromagnetic energy.

How are electromagnetic frequencies measured?

EMFs are measured in Hertz (Hz). In an electric current, one hertz is a cycle of vibrations that takes place in one second. The more electromagnetic vibrations that occur in one second, the more data can be transmitted. One million vibrations in one second is called a megahertz (MHz). A gigahertz (GHz) is one billion vibrations per second.

What is a microwave?

Electromagnetic frequencies above 300 million cycles per second (300 MHz) and below 300 billion Hertz (300 GHz).

At what frequency do electronic devices operate?

- AM radio uses about 1 MHz to transmit music or talk.
- FM radio uses 88 MHz to 108 MHz.
- Early TV broadcasts used "very high frequency" (VHF) waves, up to 216 MHz. Later, "ultra-high frequency" (UHF) channels used up to 800 MHz.
- Most wireless internet connections and many digital mobile phones use 2.4GHz or higher.
- Current model cordless "DECT" phones use 5.8 or 6.0 GHz.
- New body scanners at airports operate at frequencies above 300 GHz.

Paula, 22: In school, I learned that the mind is most restful when it cycles seven times per second. The Earth vibrates at 7.83 Hz, almost eight cycles per second. This field is called the Schumann Resonance. It makes sense that a restful mind vibrates in sync with the Earth. But now we're surrounded by devices that vibrate from fifty or sixty to six billion times per second. How do I deal with this if my goal is a restful mind?

What is electromagnetic radiation?

When an electrical charge is accelerated, energy is released into space. This emission is called electromagnetic radiation (EMR). EMR carries energy that is usually invisible and that can move through space and penetrate most non-metal objects. Mobile phones use EMR to create an invisible wave that can carry your voice or other data. X-ray machines use such high frequencies that they can even penetrate most metals. Microwave ovens use EMR to heat food. Whenever moisture is present, such as when passing through a person, some radiation is absorbed, creating heat or molecular movement.

How did our government determine that cell phones are safe?

The Food and Drug Administration (FDA) decided that cell phones are safe since the body temperature of a six-foot, 200 pound man using a cell phone for six minutes does not change significantly. The FDA has not conducted studies about how mobile phones, WiFi, antennas and wireless utility meters (alone or in combination) affect babies, children, pregnant women, the elderly, the infirm, or people with medical implants. Some scientists point to the non-thermal effects of using a cell phone:

- After 20 minutes of use, double-strands of DNA break into fragments. If the body's repair systems can't keep up with these breaks, cancer and birth defects can result.¹
- Cancer rates increase, especially when people begin using mobile phones as children and then anyone uses one for 30 minutes or more per day for ten years or longer.^{2, 3}
- After two hours of use, the blood-brain barrier begins to leak, allowing neurotoxins in food or from the environment (air or water) to affect brain and nerves, eventually leading to brain cell death.⁴

Didn't the World Health Organization report that evidence of harm from cell phone use was not convincing?

Yes. However, the report was authored by Michael Repacholi, an industry consultant who received hundreds of thousands of dollars from corporations with vested interests.⁵

Some city planners claim that radiation emitted from WiMax is much too weak to affect human health. Is that true?

In *Dirty Electricity*, epidemiologist Samuel Milham MD MPH Writes, "When industry apologists say that fields are too weak to cause biological effects, I point them to any number of electro-therapeutic devices, such as pulsed high-frequency field generators that are used to accelerate the healing of bone fractures. Anything that can stimulate cell division and growth is a potential carcinogen." (<http://sammilham.com/contact.shtm>)

How does WiFi impact health?

According to environmental consultant Stan Hartman, having a WiFi antenna in a router on your desk gives you about the same amount of radiation that you'd get 30 meters or less from a typical cell phone antenna.

In isolated human cells, WiFi-like signals can activate the "cell suicide" response.⁶

Are trees affected by WiFi?

Trees in areas with high WiFi activity have been found to suffer from bleeding, fissures in their bark, the death of parts of leaves, and abnormal growth. In the Netherlands, 70% of urban ash trees suffer from radiation sickness, including a "lead-like shine" on their leaves, indicating the leaves' oncoming death. In 2005, only 10% of ash trees suffered radiation sickness.⁷

Is there any relationship between mobile phones, antennas and bee colony collapse?

In India, a study conducted by Dr. Sainuddin Pattazhy shows that EMR emitted by antennas cripples the "navigational skills" of worker bees who leave their colonies to collect nectar from flowers. When a mobile phone was kept near a beehive, the worker bees did not return, and the colony collapsed within ten days.⁸

How does living near a mobile phone base station (also called a cell tower or cell antenna) affect human health?

Studies find that people living within 300 meters of a base station experience fatigue, headache, sleep disruption, irritability, depression, decreased libido, memory loss, dizziness, nausea, loss of appetite, visual disruptions and overall discomfort.⁹

David Carpenter, MD, Director of the Institute for Health and the Environment at SUNY Albany: *A growing body of evidence shows that wireless devices harm health, including when radiation from these devices does not cause body tissue to heat. Prolonged exposure to radiofrequency radiation increases the risk of cancer. New studies show that children are much more vulnerable than adults. I am particularly concerned about this, given that children are now regular users of wireless devices.*

Leah Morton, MD, doctor of family medicine since 1979: *My patients frequently report that their health worsened when they got a cell phone or WiFi, or an antenna or a wireless utility meter was installed near their home, school or workplace. They need to drastically reduce their exposure to radiation, but because of The Telecom Act, that's often not possible.*

If our health depends on looking squarely at scientific evidence, then we need to revise the Telecom Act so that health can be considered in relation to telecom equipment. The FCC must change its radiation exposure standards to comply with The BioInitiative Report. We need radiation levels tested and reported regularly to the public. We need more publicly-funded studies about how using wireless devices and residing near an antenna and/or with a wireless utility meter on your home affect sleep, memory, blood pressure, attention spans, anxiety, depression, addictive behavior and fertility. We need studies about the combined effects of pesticides and other neurotoxins and microwave radiation. We need studies about how wireless devices affect people with metal dental work, pacemakers and other implanted medical devices.

How do I know if my health is affected by wireless devices?

Some people smoke several packs of cigarettes every day and never get sick. Some people get lung cancer or other diseases from second-hand smoke. Likewise, people respond differently to EMR. People who live and work near antennas, use mobile phones and WiFi and have a wireless utility meter on their home are exposed to different amounts of radiation than people who use only corded phones, have no WiFi and live and work far from an antenna. Every person arrives at the threshold of over-exposure to microwave radiation uniquely. Over-exposure to radiation creates Radio Frequency Sickness. Symptoms include disturbed sleep, ear ringing, headaches, dizziness, nausea, heart arrhythmia, memory loss, altered sugar metabolism, stroke, skin rashes, extreme agitation, and other reactions.

Can I get Radio Frequency Sickness if I don't use wireless technologies?

Yes. Using contemporary TVs, computers, printers and energy-saving washing machines, compact fluorescent bulbs and/or other electronics in a house or building causes "dirty power," where radio waves pulse on the electrical wiring. Occupants of such buildings can experience Radio Frequency Sickness. Wireless utility meters can also create dirty power and Radio Frequency Sickness. (See "Electro-Shocker" by Michael Segel in Prevention's January, 2010 issue.)

Michele, 52: *I had good health, a cell phone and WiFi until September, 2009. I work at home, but starting that month, I couldn't focus enough to work. I couldn't remember words or where I'd put things. Every night, I woke up agitated several times. I was always on high alert. Privately, I wondered if I had Alzheimer's.*

In February, 2010, during a winter storm, our electricity kept going off and on. I got a high-pitched, painful ring in my right ear. I started having heart palpitations and nightmares, and my other symptoms got stronger. I wondered if something was wrong with our electricity. My electrician wondered if Con Edison had installed a wireless meter on our home. They had--in June, 2009.

After several phone calls and a letter from my doctor, Con Ed removed the Smart Meter they had installed on our house. Within days, the pulsing and loud buzzing quieted, and my thinking got clear again. But now, if I'm near a cell phone or WiFi or if I drive by a cell tower, I get sharp pain in my ear and pressure in my head.

I consider the Smart Meter my tipping point. Unfortunately, my neighborhood is still flooded with these meters. Each one transmits pulses of microwave radiation 24/7. When I requested studies about the meters' effects on human health, Con Edison told me I'd need a subpoena.

I want to continue living in my home. Even with teenagers in the house, I've been able to eliminate wireless devices inside. How can I decrease my exposure to microwave radiation that comes from antennas and my neighbors' Smart Meters?

The federal government needs to fund research about the health effects of these meters. States that have not yet installed them need to wait until Smart Meters are proven harmless.

When in human history have people noticed that their behavior was destructive--and then changed their behavior?

Hundreds of years ago, when Native American farmers realized that they depleted their soil when they planted the same crop in the same soil year after year, they began to rotate planting beans, corn and squash. Nutrients in their soil--and the vegetables--were replenished.

Around 1900, in New York City, orphaned babies were fed well and kept warm in orphanages. But many of them died. When a caretaker realized that the babies also needed to be held and lovingly touched, the babies thrived.

In the 1930s, men and women whose lives had become unmanageable because of alcoholism began meeting to share their experiences while they struggled to get sober and keep sober. They wrote the Twelve Steps and formed Alcoholics Anonymous.

In 1989, after the Soviet Union broke up, Cuba lost its oil supply. Suddenly, gas wasn't available even for trucks that transported food. The government bought three million bikes and turned available land into small farms. Scientists developed bio-dynamic fertilizers and pesticides that were not petroleum-based. Communities were strengthened by neighborhood farmers' markets, public transportation and sharing TVs.

When toxic waste from factories and petroleum-based farms made key waterways undrinkable, some people developed mycoremediation: growing mushrooms that eat sludge. The water becomes drinkable again.

Have any governments or professional organizations banned or warned against wireless devices?

- In official comments to the FCC about guidelines for evaluation of electromagnetic effects of radio frequency radiation (FCC Docket ET 93-62, November 9, 1993), The Environmental Protection Agency found that the FCC's exposure standards are "seriously flawed." www.emrpolicy.org
- The Food and Drug Administration commented to the FCC on November 10, 1993 that "FCC's rules do not address the issue of long-term, chronic exposure to radiofrequency fields." www.emrpolicy.org Exhibit 46 p. 410.
- In 2004, the International Association of Fire Fighters declared that it opposes communication antennas on fire stations. www.emrpolicy.org
- The government of Frankfurt, Germany states that it will not install WiFi in its schools until it has been shown to be harmless. www.magdahavas.com/wordpress/wp-content/uploads/2010/09/German_Swiss_Wifi_In-Schools_Warn.pdf p.5

- In 2007, The European Environmental Agency, Europe's top environmental watchdog, calls for immediate action to reduce exposure to radiation from WiFi, mobile phones and their masts. [http:// www.eea.europa.eu/highlights/radiation-risk-from-everyday-devices-assessed](http://www.eea.europa.eu/highlights/radiation-risk-from-everyday-devices-assessed)
- In 2008, The International Commission on Electromagnetic Safety (comprised of scientists from 16 nations) recommends limiting cell phone use by children, teenagers, pregnant women and the elderly. www.icems.eu/resolution.htm
- The U.S. Fish and Wildlife Service urges Congress to investigate the potential relationship between wireless devices and bee colony collapse in May, 2009. <http://electromagnetichealth.org/electromagnetichealth-blog/emf-and-warnke-report-on-bees-birds-and-mankind/>
- In 2010, municipalities in California, Hawaii, Maine and Maryland have passed resolutions creating moratoriums on Smart Meters. For updates, check www.emfsafetynetwork.org or www.magdahavas.com/2010/12/03/smart-meter-installation-challenged/

Jay: I run a small city's land use department. Recently, a telecom company proposed installing an antenna in a church steeple here. The church houses a nursery school. Parents do not want this antenna near their children. As a public servant whose job is to uphold land use codes, my choice is between permitting the antenna and a lawsuit from the telecom company for non-compliance, which they will surely win.

As I see it, concerned citizens need to petition their Congressional reps to revise Section 704 of The Telecom Act so that health concerns can be considered when a telecom company wants to install equipment.

REALISTICALLY, WHAT CAN I DO?

1. Reduce your exposure to EMR:

- Turn your WiFi off at night. If you're not sure how to do this, unplug your computer and your modem.
- Go back to a corded landline. Go back to cabled internet access. Don't use your mobile phone for a week, and see if your health or sleep changes.
- Quit fluorescent lights. While they save energy, fluorescent lights create dirty electricity. Also, fluorescent bulbs are made with mercury. They're highly toxic if broken or not disposed of at a special recycling facility. Go back to incandescent bulbs.
- Unplug the electronic devices in and near your bedroom while you sleep. Don't just turn off your TV, computer, and alarm clock. Unplug them.
- Eliminate baby monitors, which commonly transmit in microwave range. Switch to a wired intercom.
- Avoid using and replace dimmer switches.

- Remove your metallic dental materials, including mercury, nickel and palladium. They are toxic on their own and may increase adverse effects of exposure to EMR. "Silver" fillings are actually a mix of (very toxic) mercury and other metals. Mixed metals produce electric current in the mouth. This "battery effect" can disturb the brain and nervous system. Be aware: only well-trained, well-equipped dentists who use necessary protections should remove mercury amalgams. For a list of such dentists in your state, call Dental Amalgam Mercury Solutions (DAMS) at 651.644.4572 or email dams@usfamily.net.

Liz, 27: I spent a day on a train and was nauseous the whole time. I've ridden trains before and never had a problem. A friend wondered if the train's new WiFi system might have affected me.

I had no idea that WiFi could be harmful. But I noticed that my health problems (depression and a sinus infection that would not quit) started around the time my husband and I got cell phones and WiFi. As I learned more, I felt unsafe talking on the cell phone. My husband and I want children, and we want them to have a healthy start.

We decided to go back to a corded landline and cabled internet access. This actually took two months, including a five-hour "conversation" with our phone company and a week when we had no phone. We kept a cell phone for emergencies.

Now, my husband and I feel remarkably less anxious. And since we're not available to each other all the time, we're actually communicating more clearly.

2. If you use a mobile phone:

- Keep it off. Remove the battery from the phone. Install the battery only when you use the phone.
- At home, use a corded landline. Eliminate (recycle) DECT cordless phones and their (sometimes corded) base stations, which emit radiofrequency radiation similar to that of cell phones. A non-electric corded landline allows you a working phone during electric blackouts.
- Away from home, use text messaging rather than voice, since phones emit radiation for a shorter amount of time to send text; and the phone is not against your head when you text.
- Educate your children about the hazards of cell phones. The hazards of radiation are greater for children than they are for adults. They should never sleep with the phone on or charging near their bed.
- Keep calls short. Using a mobile phone for 30 minutes a day is the heaviest use studied so far, and it significantly increases your risk of brain cancer.²
- Be aware that the weaker an antenna's signal, the more your cell phone has to increase its radiation output to maintain the connection, which increases your exposure. When reception is bad (such as in rural areas) use your phone only for emergencies. Swedish research finds worse health effects for cell phone users in rural areas.
- Don't text or phone in a metal box such as an elevator, car, bus or train, since this also requires your phone to increase its radiation output.

- Don't text or talk while driving. Studies have demonstrated that texting or talking on a mobile phone while driving is more dangerous than driving drunk, even with a hands-free device.
- Some scientists and physicians recommend using speaker phone mode or headsets to reduce the radiation that enters your brain. While there are no studies about these devices, in speaker phone mode (if the antenna is away from the head), less energy enters the user's head. A Blue Tooth earpiece broadcasts a signal that's lower in intensity than if the cell phone were next to the head. However, if the Blue Tooth device is on a long time, then the total energy transmitted into the head could increase.
- Pregnant women should not use cell phones. One study finds that a mother's cell phone use nearly doubles the chance of a child's developing behavioral problems, even after correcting for other effects.¹⁰ In an emergency, keep the phone away from your abdomen. New mothers should not speak or text on a mobile phone while holding the device near the baby's head. A baby's developing brain is especially susceptible to radiation.
- Men who plan to become fathers should not keep their cell phones in their pockets or on their belts. They should keep their cell phones turned off. Cell phone use negatively affects sperm quality.¹¹ (Studies about the effects of carrying a mobile phone on women's reproductive health have not been conducted; but women might apply the Precautionary Principle here.)
- Some cities like San Francisco now require cell phone retailers to reveal the SAR (specific absorption rate of microwaves into the user's head) of each phone. Beware that while the highest SAR phones may pose the greatest risk of thermal damage, even the lowest SAR phones can cause non-thermal effects, including nerve cell death.
- Be aware that no study has considered the relationship between cell phones, WiFi and wireless utility meters and the risk of cancers below the neck, including leukemia, lymphoma, skin and pancreatic cancers.

Jesse, 46: I'm an electrical engineer. Recently, I learned about Bayville, NY, a small town with a high incidence of childhood leukemia and other forms of cancer among children and adults. Their elementary school's property line is 50 feet from a water tower with nearly 60 antennas on it. At one point, seven of the school's 21 staff members had some form of cancer. Because of the Telecom Act, these townspeople can't move these cell phone antennas or even question freely whether they contribute to their health problems.

Meanwhile, around the country, water towers are covered with antennas. Radiation levels around them can exceed FCC guidelines. FCC guidelines are one thousand times higher than what a number of researchers consider safe. So I worry--about the workers who go up on water towers, and about the people who live near them.

3. Get Informed and Take Political Action:

- Learn about your neighborhood's antennas at www.antennasearch.com
- Alert owners about antennas' effects on property values before they contract with a telecom company. For more info, see www.emrpolicy.org
- Learn about your town's telecom ordinance. Many ordinances allow telecom companies to install antennas on easements to private property without notice or permission. Create the most protective ordinance possible for your municipality. Refer to *Cell Towers: State of the Science/State of the Law*, edited by B. Blake Levitt. Get your city to join the Coalition for Local Oversight of Utility Technologies; www.CLOUTnow.org
- Petition your Congressmen and women to revisit Section 704 of The Telecom Act of 1996 so that health and environmental concerns can be recognized when a telecom company wants to do business. Petition for a moratorium on new wireless equipment until it's proven harmless. See www.prove-it.co
- If a device makes you sick, report the problem to the FDA's Medwatch Program, www.accessdata.fda.gov/scripts/medwatch/medwatch-online.htm or call 800.FDA.1088. Also report it to the Consumer Product Safety Commission, which takes dangerous products off the market. www.cpsc.gov/cgibin/incident.aspx or call 800.638.2772. Send a copy of your complaints to The EMR Policy Institute at info@emrpolicy.org with "Radiation Emitting Product Complaint" in the subject heading.
- Divest. If you own telecom stock or subscribe to wireless services, divest.

Which do you think is more important: a telecommunications system that meets engineering standards or safeguarding the ecosystem and human health?

RESOURCES

Websites:

www.emrpolicy.org The EMR Policy Institute educates policy makers on the need for sound public policy that protects public health regarding electromagnetic radiation.

www.bioinitiative.org 2007 international scientific report that reviews some 2000 published papers on exposure to electromagnetic fields. It provides a rationale for biologically-based public exposure standards.

www.cloutnow.org Communities for local oversight of public utilities. Archive of local government resolutions calling for revision of the Telecom Act of 1996.

www.electricalpollution.com The solutions page tells how to clean up electrical pollution in your home or business.

www.electromagnetichealth.org Includes a petition for radiation "quiet zones."

www.emfacts.com/electricwords An index of scientific studies.

www.international-emf-alliance.org/index.php/appeals Lists groups that call for stricter regulation and/or a moratorium on wireless technology.

www.lehmans.com A catalog of non-electric tools and appliances.

www.lessemf.com Products for people with electric sensitivity.

www.mast-victims.org Testimonies from people harmed by antennas.

www.microwavenews.com Since 1981, this journal has reported health and environmental impacts of EMR.

www.prove-it.co A petition for a moratorium on new antennas and wireless utility meters until they're proven harmless.

www.weepinitiative.org International news about EMR.

DVDs:

Full Signal, filmmaker Talal Jabari. Scientists, doctors, advocates and concerned citizens from eight countries discuss cell phones, antenna sites and health.

The Power of Community, produced by Community Solutions. Cuba's response to losing its oil supply in 1989.

Magazine Articles:

"Cell-Phone Safety: What the FCC Didn't Test," by Michael Scherer, *Time*, October 26, 2010.

"Electro Shocker," by Michael Segell, *Prevention Magazine*, January, 2010. How dirty electricity created a cancer cluster at a California school.

"Warning: Your Cell Phone May Be Hazardous to Your Health," by Christopher Ketcham, *GQ*, February 2010.

Scientific Journal:

Pathophysiology, Aug. 2009. Special issue devoted to EMR and health. Provides peer review of The BioInitiative Report.

Books:

Davis, Devra, *Disconnect*, Dutton, 2010.

Gittleman, Ann Louise, *Zapped*, Harper, 2010

Milham, Samuel, *Dirty Electricity: Electrification and the Diseases of Civilization*, iUniverse, 2010.

Reese, Camilla and Magda Havas, *Public Health SOS*.

Sugarman, Ellen, Warning: *The Electricity Around You May Be Hazardous to Your Health*, Simon and Schuster, 1992

GLOSSARY

2G—Antennas that serve "second generation" digital cell phones. 3G, "third generation" includes video and smart phones.

Bandwidth—Bandwidth refers to the range of frequencies used to transmit data, whether or not the data is sent within cables or by a wireless device. Video requires more bandwidth than voice; voice requires more bandwidth than text.

Broadband—An internet connection with high bandwidth (large range of frequencies) that allows large amounts of data for a movie or video game, for examples, to be transmitted quickly.

Corded phone—A phone with a base that plugs into a wall-jack; the mouthpiece also connects to the base by a cord.

Dirty electricity—The wiring in most houses, schools and offices is designed for electrical devices that operate at 60 Hz, but cordless phones, TVs, dimmer switches, fluorescent light bulbs, solar panels, energy-saving washing machines and computers (etc.) "chop up" the 60 Hz current and create high frequency transients. Termed "electrical sewage" by electrical engineer Dr. Martin Graham, these high frequencies contaminate wiring running throughout the building and expose occupants to radiation. People exposed to strong dirty electricity may develop Radio Frequency Sickness or cancer. For more info, read "Electro-Shocker" by Michael Segell in Prevention's January, 2010 issue; see www.electricalpollution.com

Fiber optics—Very thin, transparent cables that carry signals by pulsing light. Fiber optic cables offer the fastest connection, the greatest capacity, the most security, and the lowest EMR of available technology. They require much less electrical power than antennas to transmit signals.

Frequency—The number of times per second that either the electric or the magnetic field completes a full cycle (a positive maximum falling to a negative maximum and increasing back to the positive maximum again).

Gigahertz (GHz)—One billion vibrations per second. Cordless phones now commonly operate at 5.8 GHz, nearly six billion vibrations per second.

Hertz (Hz)—The number of vibrations that either the electric or magnetic component completes in one second.

Kilohertz (kHz)—One thousand vibrations per second.

Megahertz (MHz)—One million vibrations per second.

Microwave—An electromagnetic field that has 300 million vibrations per second—or more, up to 300 GHz.

Precautionary Principle—Suggests that we not use a product when its safety is unknown and alternatives are available. Developed in 1998 by scientists, farmers and breast cancer action groups who observed that many hazardous products (such as pesticides) are assumed to be safe when they are introduced to the marketplace. But when they are used repeatedly or in combination with other hazardous products, harmed health results.

Radiation—Energy that transmits information through space or through matter. The frequency of electromagnetic radiation determines the extent to which it can carry data and can penetrate metal roofs, thick walls and people. The frequencies at which electric fields best penetrate beneath skin are microwaves, X-rays and gamma rays.

Radiofrequency (RF)—Electromagnetic radiation at frequencies between 30 kHz and 300 GHz.

Satellite—Stationed in space, telecom satellites transmit information to Earth by microwave radiation. This technology allows data to be distributed to remote locations, including places blocked by mountains or an ocean. It is used by nationally-distributed TV networks, phone providers, the military and newspapers. Satellite dishes used on homes for satellite TV use active electronics to convert the signals to lower frequencies that can then be sent to your TV using standard coax cables. These conversion devices are another source of radiation and high-frequency transients, i.e. dirty electricity.

Transformer—A transformer can be the size of a city block or as small as a "wall wart" at the end of cell phone charger. Transformers change the frequency and/or the voltage of electricity. At close range, transformers always create EMR. Newer transformers are smaller and more energy efficient, but also create much more dirty electricity.

WiFi—Stands for wireless free Internet. WiFi lets people with laptops access the Internet without a cord. WiFi is now commonly available in schools, businesses and on many trains and airplanes. WiFi operates at 2.4 GHz.

WiMax—A wireless system that can transmit broadband signals up to 30 miles from an antenna. WiMax provides wireless internet access with a significantly stronger signal than WiFi.

Wireless devices—Cordless phones, mobile phones, utility meters, baby monitors, doorbells, remote-controlled toys, alarm systems and WiFi that work without cables. Most TV remote controls use infra-red, which does not appear to pose the same risk as microwave wireless devices.

X-ray—Penetrating electromagnetic radiation that takes a picture through the skin's surface to x-ray a bone, for example. Radiation from new body scanners at airports penetrates only the skin layer. X-rays use such high frequencies that electrically conductive materials can't block them; only heavy nuclei like lead can.

ENDNOTES

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